

# ASHRAE/IESNA STANDARD 90.1

*ENERGY STANDARD FOR BUILDINGS  
EXCEPT LOW-RISE RESIDENTIAL BUILDINGS*

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# DEVELOPMENT OF STANDARD 90.1

- **Promulgating organizations:**
  - *ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers)*
  - *IESNA (Illuminating Engr Society of North America)*
- **Background:**
  - *Standard 90 has been basis for energy codes since it was first published in 1975*
  - *Previous standard version adopted in 1989; Codified version in 1993*
  - *Current version published in 1999*
- **ASHRAE/IESNA Standard 90.1-2001 – Fall 2001**

# CODE COMPLIANCE ISSUES FOR APPLICANTS AND CODE OFFICIALS

- Applicants who don't know the code and simply want a permit, or those who design beyond code but want easy compliance:
  - *provides prescriptive option with minimal calculations*
- Applicants who want flexibility:
  - *provides multiple compliance options (ENVSTD, lighting wattage)*
- Need for consistent information sources:
  - *NFRC ratings for fenestration (windows, skylights, doors)*
  - *tables of pre-calculated U-factors for opaque assemblies*

# FEATURES OF STANDARD 90.1-1999

- **Written in mandatory, code-enforceable language throughout:**
  - *minimum requirements*
- **Organized by design discipline**  
(building envelope, HVAC, and lighting):
  - *corresponds with stages of the permitting process*  
*(building permit, mechanical permit, electrical permit)*
- **Criteria based on common construction**
  - *typical opaque assemblies with thermal bridges for the building envelope, actual projects for lighting*

# BUILDING ENVELOPE FEATURES

- All requirements for climate location in one-page table
- Prescriptive compliance option
  - *can specify R-value of insulation and NFRC U-factor and SHGC ratings for fenestration, no calculations required except for fenestration area, OR*
  - *can look up tabulated U-factors for 2500 common roof, wall, and floor assemblies*
- ENVSTD trade-off option
  - *includes all components of building envelope*
  - *drop-down menus contain all default assemblies*
  - *output provides detailed listing of assemblies and corresponding areas to facilitate comparison with plans*

# HVAC & LIGHTING FEATURES

- **HVAC (heating, ventilating, & air-conditioning)**
  - *simple systems compliance option*  
(applies to packaged equipment in low-rise buildings)
- **Lighting**
  - *building area compliance option for lighting wattage*  
(such as office, retail)
  - *space-by-space compliance option for lighting wattage*  
(such as emergency room, pharmacy, nurse's station, etc.)
  - *lighting control requirements simplified*

# ADMINISTRATIVE FEATURES

- **Clarifies application to existing buildings, additions, alterations, and change of use**
  - *additions treated same as new construction*
  - *altered portions only to comply (subject to limitations)*
  - *change from unheated space to heated space to comply*
- **Documentation and labeling simplify plan review and inspection**
  - *compliance documents to contain all necessary information*
  - *insulation to be labeled with R-value, fenestration labeled with U-factor and SHGC, mechanical equipment identified*

# ADDENDA APPROVED FOR 2001 VERSION

## *34 Total Addenda*

- *16 involve substantive changes*
  - *Changes to criteria*
  - *Changes to exceptions*
  - *Increased flexibility of requirements*
- *18 involve clarifications or editorial changes*
- *HVAC=11, Envelope=9, Lighting=7,  
Admin/Enforce.=2, ECB=2, SWH=1, Power=1,  
Definitions=1*



# RESOURCES FOR IMPLEMENTATION

- *Users Manual includes examples and sample compliance forms*
- *Users Manual includes ENVSTD software for Windows*
- *Professional Development Seminar – “Complying with Standard 90.1” scheduled for January 2002 at ASHRAE Winter Meeting, Atlantic City, NJ*

# RESOURCES FOR IMPLEMENTATION (Cont.)

- *Continuous Maintenance*
  - Proposed addenda may be submitted at any time
  - SSPC must take documented, consensus action within one year, and must notify proposer of action
- *Interpretation requests handled by 90.1 Committee*
  - Informal (unofficial): Chair or staff respond
  - Formal (official): SSPC approves response

# CODE INTERACTION

## SUBCOMMITTEE OBJECTIVES

- *Work closely with model code organizations to incorporate features of 90.1 and 90.2*
  - Adoption by reference
  - By insertion of key 90.1 and 90.2 elements, as appropriate
- *Synchronize with model code cycles*
  - Republish standards on 3-year cycle coordinated with model code organizations

# CONCLUSIONS

- *ASHRAE provides a forum in which complicated technical issues can be resolved and consensus achieved*
- *Subject to negotiation and compromise*
- *Process has been streamlined to be more responsive and timely*
  - *continuous maintenance*
  - *procedures overhaul*
- *All are invited to participate*